

REMARKS

Applicants appreciate the Examiner's thorough consideration provided in the present application. Claims 1, 2, 4, 7-10 and 12-24 are now present in the application. Claims 1, 9, 22 and 24 have been amended. Claims 1 and 9 are independent. Reconsideration of this application, as amended, is respectfully requested.

Claim Rejections Under 35 U.S.C. §112

Claims 22 and 24 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

While not conceding to the Examiner's rejection, but merely to expedite prosecution, as the Examiner will note, independent claims 22 and 24 have been amended back to their previous version presented in the Amendment dated December 19, 2006. In view of the foregoing amendments, it is respectfully submitted that this rejection has been addressed. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, first paragraph, are therefore respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 2, 4, 9, 10 and 12-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over von Gutfeld et al., U.S. Patent No. 6,055,035 (hereinafter "Gutfeld"), in view of Paton et al., U.S. Patent No. 4,018,383 (hereinafter "Paton"). Claims 7 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gutfeld in view of Paton, and further in

view of Masazami et al., U.S. Patent No. 6,331,884 (hereinafter "Masazami"). These rejections are respectfully traversed.

Complete discussions of the Examiner's rejections are set forth in the Office Action, and are not being repeated here.

In light of the foregoing amendments, Applicants respectfully submit that these rejections have been obviated and/or rendered moot. While not conceding to the Examiner's rejections, but merely to expedite prosecution, as the Examiner will note, independent claims 1 and 9 have been amended.

Independent claim 1 has been amended to recite a combination of steps including "placing a resonating plate between a resonator and the projecting portion and outside of the projecting portion" and "applying an on voltage to the resonator during emitting of the liquid crystal material to generate a vibration with only a specific frequency by the resonator so as to apply a pressure to the projecting portion to emit the liquid crystal material from the projecting portion, wherein the generated vibration is transmitted from the resonator to the projecting portion through the resonating plate such that the resonating plate vibrates with the same specific frequency."

Independent claim 9 has been amended to recite a combination of elements including "a resonator for generating a vibration with only a specific frequency upon application of an on voltage to the resonator during emitting of the liquid crystal material" and "a resonating plate located between the resonator and the projecting portion and outside of the projecting portion, the resonating plate vibrating with the same specific frequency and transmitting the vibration to

the projecting portion so as to apply a pressure to the projecting portion to emit the liquid crystal material from the projecting portion.”

Support for the amendments to claims 1 and 9 can be found on paragraph [0036] of the specification as originally filed. Applicants respectfully submit that the above combinations of steps and elements as set forth in independent claims 1 and 9 are not disclosed or suggested by the references relied on by the Examiner.

The Examiner referred to Gutfeld’s apparatus 20 as the projection portion of claims 1 and 9. The Examiner has correctly acknowledged that Gutfeld fails to teach a resonator and a resonating plate as recited in the combination of claims 1 and 6 and in claim 9. The Examiner then turned to rely on Paton’s teachings and construed Paton’s piezoelectric crystal 5/39 and impervious membrane 38 as the resonator and the resonating plate of the claimed invention, respectively.

However, Paton in col. 7, lines 12-24 discloses as follows:

The process of the invention is preferably carried out by passing a pressurised liquid through a nozzle, modulation of the liquid stream which issues from the nozzle being achieved *by the use of a piezoelectric crystal to which is applied a combined signal comprising the high frequency alternating signal of the fundamental frequency* which causes drop formation together *with a second high frequency alternating signal whose frequency is twice that of the fundamental signal*. Thus, for example, when the frequency of the fundamental signal is 64 kHz so that drops are produced at the rate of 64000 per second, the frequency of the second signal will be 128 kHz. (Emphasis added).

In other words, Paton’s piezoelectric crystal 5/39 generates a vibration with *two* frequencies (i.e., a fundamental frequency and a higher frequency), not just a single specific frequency as recited in claims 1 and 9. Since the impervious membrane 38 is in contact with the piezoelectric crystal 5/39, it also vibrates with the same *two* frequencies as the piezoelectric crystal 5/39. Therefore,

Paton fails to teach “applying an on voltage to the resonator during emitting of the liquid crystal material to *generate a vibration with only a specific frequency by the resonator* so as to apply a pressure to the projecting portion to emit the liquid crystal material from the projecting portion, wherein the generated vibration is transmitted from the resonator to the projecting portion through the resonating plate such that *the resonating plate vibrates with the same specific frequency*” as recited in claim 1, and “*a resonator for generating a vibration with only a specific frequency* upon application of an on voltage to the resonator during emitting of the liquid crystal material” and “a resonating plate located between the resonator and the projecting portion and outside of the projecting portion, *the resonating plate vibrating with the same specific frequency* and transmitting the vibration to the projecting portion so as to apply a pressure to the projecting portion to emit the liquid crystal material from the projecting portion” as recited in claim 9.

In the alternative, Gutfeld uses the inkjet head to dispense the liquid crystal material. Gutfeld in col. 5, lines 50-58 further discloses “...the nozzle fixture 21, the scanning arm 24, and the reservoir 23 are computer-controlled by a central processing unit 25 or the like, *to maintain the proper pressure* and travel speed to obtain the correct amount of liquid crystal deposit on the panel...” That is, Gutfeld explicitly teaches that the proper pressure is maintained to the liquid crystal in the reservoir. However, Paton teaches that the pressure to the liquid crystal is *vibrated*. Therefore, Gutfeld teaches away from the teachings of Paton’s vibrated pressure.

In addition, Gutfeld’s structure is disadvantageous due to its difficulty to apply the same pressure to all nozzles. This is because the pressure at the nozzles closer to the first end of the nozzle fixture 21 (where the liquid crystal material enters) is always larger than the pressure at the nozzles closer to the second end of the nozzle fixture 21 opposite to the first end.

With regard to the Examiner's reliance on Masazami, this reference has only been relied on for its teachings related to some dependent claims. This reference also fails to disclose the above combinations of steps and elements as set forth in independent claims 1 and 9. Accordingly, this reference fails to cure the deficiencies of Gutfeld and Paton.

Accordingly, none of the references relied on by the Examiner individually or in combination teach or suggest the limitations of independent claims 1 and 9. Therefore, Applicants respectfully submit that independent claims 1 and 9 and their dependent claims (at least due to their dependency) clearly define over the teachings of the utilized references.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

Application No. 10/028,433
Amendment dated November 2, 2007
Reply to Office Action of August 2, 2007

Docket No.: 3430-0175P

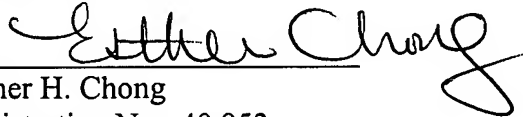
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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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